

REMARKS**Introduction*****Status of claims***

Claims 1 to 16 are pending in the application, and these claims stand rejected. Specifically, claims 1 to 6, 8, 9, and 11 stand rejected under 35 U. S. C. § 102 (b), claim 10 stands rejected under 35 U. S. C. § 103 (a), and claims 12 to 16 also stand rejected under 35 U. S. C. § 103 (a).

Claims 1, 9, 12, and 15 have been amended in this response to the outstanding Official Action.

Basis for amendments to claims

Claim 1 has been amended to incorporate the minimum mass fraction of silicon within the material of the brake lining as disclosed on page 6, lines 25 to 27 of the specification.

Support for amended Claim 9 is found at page 6, lines 27 and 28.

Support for amended claim 12 is found at page 6, lines 25 to 27 of the specification.

Support for amended claim 15 is found at page 8, lines 11 to 13, and at page 13, lines 1 to 4, of the specification.

No new matter has been introduced, and entry of the amended claims is respectfully requested.

The Office Action***Rejection under 35 U. S. C. 102 (b)***

Claims 1 to 6, 8, 9, and 11 stand rejected under 35 U. S. C. 102 (b) over Krenkel et al, US 6,668,985 ("Krenkel").

Krenkel discloses a friction element for a safety braking device comprising a body formed of a fiber-reinforced ceramic composite material having a matrix of silicon carbide and carbon, which friction element body has a mass fraction ("content in mass percent") of Si in a range of from 2 % to 6 %. See claim 1, col. 8, lines 30 to 32, and col. 5, lines 23 and 24.

This mass fraction of silicon as disclosed by Krenkel is clearly outside the range of a mass fraction of silicon of at least 10 % as defined in amended claim 1. The composition of the brake lining as defined in amended claim 1 is therefore not anticipated by Krenkel.

It is also not obvious from Krenkel to choose a range of mass fraction of silicon of at least 10 % because increasing the silicon content has an adverse affect on the coefficient of friction and the comfort characteristics. It has surprisingly been found in the experiments that have led to the instant patent application that increasing the silicon content while keeping it below the mass fraction of silicon carbide is advantageous for a brake lining material because the anisotropy of heat conduction via the carbon fibers is more pronounced by such composition.

It is therefore believed that amended claim 1 and dependent claims 2 to 11 are patentable over this cited art.

Rejection under 35 U. S. C. 103 (a)

Claims 12 to 16 stand rejected under 35 U. S. C. 1903 (a) over Withers et al, US 6,051,167 ("Withers").

Withers is directed to a method of making a carbon composite structure from a matrix of non-crystalline carbon particulate soluble in an organic solvent, a binder comprised of an organic carbon precursor that has a liquid phase, and an organic solvent, forming an uncured structure of that mixture, by combining that mixture with

a reinforcement material, and curing the structure, and subsequently pyrolysing it in an inert atmosphere. This pyrolysed object is then subjected to chemical vapor infiltration. See col. 5, lines 42 to 60, and col. 6, lines 45 to 50.

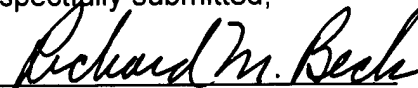
Withers is silent as to infiltration with liquid silicon, in the form of a melt, as is distinctly set forth in claim 12. The section "Whiskerising" discloses only the treatment with gaseous silicon oxide (col. 10, lines 43 to 45), and Si vapor (column 11, line 3). There is no teaching or suggestion that liquid silicon could be used instead of gaseous silicon or gaseous silicon compounds. There is also no mention that unreacted silicon might, or should, remain in the body so infiltrated, nor is there a suggestion that this mass fraction should be in excess of 10 %. According to amended claim, 12, the process must be conducted in a way that a mass fraction of at least 10 % of silicon is formed in the material after the infiltration step. Moreover, there is also no suggestion in Withers that the reinforcing fibers should be arranged essentially in a plane. Therefore, it is deemed that the process defined in amended claim 12 is not rendered obvious by Withers.

Withdrawal of this reason of rejection is therefore respectfully requested.

Conclusion

Based on the foregoing remarks and explanations, it is believed that claims 1 to 16 are in condition for allowance, and such action is earnestly requested.

Respectfully submitted,

By 

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